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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,686	02/04/2002	Hiroshi Sakai	81868.0041	6988

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EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT PAPER NUMBER

2652

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/067,686

Applicant(s)

SAKAI, HIROSHI

Examiner

Peter Vincent Agustin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-11 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Claims 4 & 7 are generic and allowable. Accordingly, the restriction requirement as to the encompassed species is hereby withdrawn and claims 6 & 9, directed to the species of figures 5 & 8 are no longer withdrawn from consideration since all of the claims to this species depend from or otherwise include each of the limitations of an allowed generic claim.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors, e.g.,

Page 4, line 13: "on" should be --one--.

Page 12, line 16: "includes" should be --include--.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Abe et al.

(hereafter Abe) (US 6,084,843).

In regard to claim 1, Abe discloses an optical pickup device (figure 9) comprising: a first light source (21A) that emits first light; a second light source (21B) that emits second light with a wavelength different from a wavelength of the first light; and a step-like diffraction element (25) that deflects one of the first light and the second light (see figures 20 & 23) to match optical axes of the first light and the second light, the step-like diffraction element defining a light incident face and a light emitting face, one of the incident face and the emitting face having multiple sets of step-like grating faces (see figure 3), wherein a step difference (figure 14, element labeled "d") between adjacent ones of each one of the multiple sets of the step-like grating faces has a measurement that generates a phase difference corresponding to one wavelength of one of the first light and the second light (column 19, lines 55-59), and the number of steps of each of the multiple sets of step-like grating faces is set at a value that maximizes one of a (+) first order diffraction efficiency and a (-) first order diffraction efficiency for the other of the first light and the second light (column 12, lines 4-14 and column 12, lines 47-52).

In regard to claim 2, Abe discloses that the step-like diffraction element straightly advances one of the first light and the second light (see figures 18 & 22), and deflects the other of the first light and the second light (see figures 20 & 23) to thereby match the optical axes of the first light and the second light.

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In regard to claim 3, Abe discloses that the step-like grating faces of the step-like diffraction element are formed in concentric circular curves (column 10, lines 7-11) when viewed from the emitting face of the step-like diffraction element.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Komma et al. (US 5,400,311) discloses a hologram having a stair-like cross-sectional configuration, and a ratio of the width of a step of the stair-like configuration relative to a grating pitch is arranged to vary in accordance with a position within a surface of the hologram.

Shiono et al. (US 6,414,930) discloses in figure 2(a) a stepped grating having eight levels designed to maximize the 1st-order diffraction efficiency.

Yoo et al. (US 6,449,237) discloses an optical recording and pickup head for a DVD compatible with a CD-RW by adopting a flat plate lens having a staircase type diffraction grating structure.

Katsuma (US 6,545,821) discloses in figure 3 a stair-like diffraction grating having four steps of equal height.

Allowable Subject Matter

8. Claims 4-11 are allowed over the prior art of record.

9. The following is a statement of reasons for the indication of allowable subject matter:

In regard to independent claim 4, no prior art of record alone or in combination discloses or suggests an optical pickup device comprising: a first light source that emits first light; a second light source that emits second light having a wavelength different from a wavelength of

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the first light; and a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light, the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces, wherein, when a wavelength λ_1 of the first light is longer than a wavelength λ_2 of the second light, a step difference between adjacent ones of the step-like grating faces has a measurement that generates a phase difference corresponding to one wavelength for the first light, and **the number of steps of each of the multiple sets of step-like grating faces is set at an integer that is closest to a value α that satisfies an expression of $\lambda_2 / \lambda_1 = \alpha / (\alpha + 1)$.**

In regard to independent claim 7, no prior art of record alone or in combination discloses or suggests an optical pickup device comprising: a first light source that emits first light; a second light source that emits second light having a wavelength different from a wavelength of the first light; and a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light, the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces, wherein, when a wavelength λ_1 of the first light is longer than a wavelength λ_2 of the second light, a step difference between adjacent ones of the step-like grating faces of each of the multiple sets of step-like grating faces has a measurement that generates a phase difference corresponding to one wavelength for the second light, and **the number of steps of each of the multiple sets of step-like grating faces is set at a value in which one is added to an integer that is closest to a value α that satisfies an expression of $\lambda_2 / \lambda_1 = \alpha / (\alpha + 1)$.**

In regard to independent claim 10, no prior art of record alone or in combination discloses or suggests a method for designing an optical pickup device comprising a first light source that emits first light, a second light source that emits second light having a wavelength different from a wavelength of the first light, and a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light, the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces, the method comprising the steps of: when a wavelength λ_1 of the first light is longer than a wavelength λ_2 of the second light, setting a step difference between adjacent ones of the step-like grating faces to have a measurement that generates a phase difference corresponding to one wavelength for the first light; and **setting the number of steps of each of the multiple sets of step-like grating faces to be at an integer that is closest to a value α that satisfies an expression of $\lambda_2 / \lambda_1 = \alpha / (\alpha + 1)$.**

In regard to independent claim 11, no prior art of record alone or in combination discloses or suggests a method for designing an optical pickup device comprising a first light source that emits first light, a second light source that emits second light having a wavelength different from a wavelength of the first light, and a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light, the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces, the method comprising the steps of: when a wavelength λ_1 of the first light is longer than a wavelength λ_2 of the second light, setting a step difference between adjacent ones of the step-

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like grating faces of each of the multiple sets of step-like grating faces to have a measurement that generates a phase difference corresponding to one wavelength for the second light; and **setting the number of steps of each of the multiple sets of step-like grating faces to be at a value in which one is added to an integer that is closest to a value α that satisfies an expression of $\lambda_2 / \lambda_1 = \alpha / (\alpha + 1)$.**

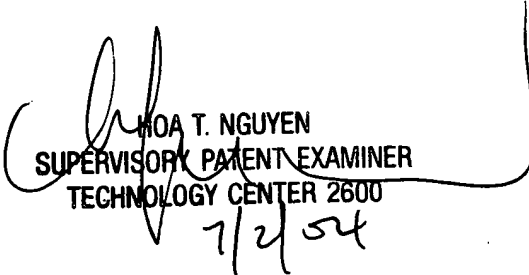
Claims 5, 6, 8 & 9 are allowed because they depend upon allowed base claims.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Vincent Agustin whose telephone number is (703) 305-8980. The examiner can normally be reached on Monday thru Friday 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PVA
06/23/2004


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